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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,588	02/27/2004	Omid Oliaei	MOTB:036US	6824

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EXAMINER

NGUYEN, LINH V

ART UNIT	PAPER NUMBER
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2819

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/788,588

Applicant(s)

OLIAEI, OMID

Examiner

Linh V. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

REXFORD BARMIE  
SUPERVISORY PATENT EXAMINER

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to communication filed on 12/1/05. Claims 1, 3, 4, 5, 11, 14, 15, 16, and 17 have been amended. Claims 18 and 19 have been added. Claims 1 – 19 are pending on this office action.

### ***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Response to Arguments***

3. Applicant's arguments with respect to amended claims 1, 5, 11, 16, 17 "mixing the input signal with oscillator signals" have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 11 rejected under 35 U.S.C. 102(e) as being anticipated by Hietala et al. (US 6,597,748).

Regarding claim 11, Fig. 1 of Yang et al. discloses complex modulator, comprising: an input for receiving an input signal (10); a mixer (22, 24) for mixing the input signal with oscillator signals (28) to produce an asymmetrical baseband input signal (output of 22, 24) having a real and an imaginary component (Col. 4 lines 6 – 11) a complex analog-to-digital converter (35, 36) for converting one of the real and imaginary components of the input signals into a quantized real output signal and a quantized imaginary output signal (Col. 4 lines 35 - 42); and a complex digital filter 37, 38) for filtering the complex real and imaginary output signals to produce a real filtered output signal (output of 37).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 – 10, 12 - 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (US 6,538,592) in view of Hietala et al. (US 6,597,748).

Regarding claim 1, Fig. 1 of Yang et al. discloses a complex (Col. 4 line 30 discloses a complex signal I and Q) Sigma-delta modulation (22) method, comprising: receiving a complex input signal (12) having a real component (I as disclosed on Col. 4 line 30 above) and an imaginary component (Q as disclosed on Col. 4 line 30 above); applying a first complex sigma-delta modulation process (22) to the complex input signal (12) to produce a first sigma-delta modulated signal (30); applying a second complex sigma-delta modulation process (52) to the first sigma-delta modulated signal (30, also see Fig. 3) to produce a second sigma-delta modulated signal (70); and conditioning the first and second sigma-delta modulated signals (30, 70) using a complex noise cancellation process (48, 98, 100, 110, 120, 130) to produce an output signal (output of 130). However, Yang et al. does not explicitly disclose mixing the input signal with oscillator signals to produce a complex asymmetric input signal having a real component and imaginary component.

Fig. 1 of Hietala et al. disclosed a down converter system with a complex (Col. 4 lines 6 – 11) Sigma Delta Modulation (35, 36) having receiving an input signal (10); mixing (22, 24) the input signal with oscillator signals (28) to produce a complex asymmetric input signal (output of 22, 24) having a real component and an imaginary component (Col. 4 lines 6 – 11).

Yang et al. and Hietala et al. are common subject matter for complex sigma-delta-modulation. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made, to incorporate the mixing with local oscillator taught by Hietala et al. into Yang et al. for the purpose of generating the

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complex signal (I, Q) by mixing with oscillator signal (suggested by Hietala Col. 4 lines 6 – 11), thereby the unwanted dc component should be able to relatively easily removed by suitable filtering of the dc component, without losing information contained in the wanted signal because the dc components (Hietala Col. 1 lines 48 – 54).

Regarding claim 2, Yang et al. as applied to claim 1 above, further discloses wherein first and second complex the sigma-delta modulation (22, 52) processes each comprising multiple-order sigma-delta modulation processes (Col. 4 lines 19 – 23).

Regarding claim 3, Yang et al. as applied to claim 1 above, further disclosed received a radio frequency modulated signal (Col. 1 lines 11 – 26).

Regarding claim 4, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 1 above, disclosed every aspect of applicant's claimed invention, and rejected along the same rationale as of claim 1.

Regarding claim 5, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 1 above, disclosed every aspect of applicant claim invention, and rejected along the same rationale as of claim 1.

Regarding claim 6, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 1 above, further disclosed wherein the first and second sigma-delta modulators (22, 52) including real integrators (Fig. 3).

Regarding claim 7, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 5 above, further disclosed the first complex sigma-delta modulator comprising a multiple-order sigma-delta modulator circuit (Fig. 3).

Regarding claim 8, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 7 above, further disclosed wherein the multiple-order sigma-delta modulator circuit including real integrators (Fig. 3).

Regarding claim 9, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 5 above, further disclosed wherein the second complex sigma-delta modulator comprising a multiple-order sigma-delta modulator circuit (Fig. 3).

Regarding claim 10, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 9 above, further disclosed wherein the multiple-order sigma-delta modulator circuit including real integrators (Fig. 3).

Regarding claim 12, the claim incorporated substantial the same subject matter as of claim 1, and rejected along the same rationale.

Regarding claim 13, Yang et al. as applied to claim 1 above, further disclosed a radio frequency signal receiver for receiving a radio frequency input signal (Col. 1 lines 12 – 22).

Regarding claim 14, Fig. 1 of Hietala et al. incorporated into Yang et al. further disclosed an antennal circuit (10) circuit coupled to the Mixers (22, 24) for receiving a modulated radio frequency signal, the mixers (22, 24) converting the modulated radio frequency signal into an asymmetric baseband signal centered about DC (Col. 1 lines 45 – 55).

Regarding claim 15, Yang et al. modified by Fig. 1[20] of Hietala et al. as applied to claim 1 above, disclosed every aspect of applicant's claimed invention, and rejected along the same rationale as of claim 1.

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Regarding claims 16 and 17, the claims incorporated the same subject matter as of claim 1 above, and rejected along the same rationale (as applied to claim 1).

Regarding claims 18 and 19, Hietala et al. incorporated into Yang et al. further disclosed the asymmetric signal comprising positive or negative frequencies (Hietala's Col. 4 lines 8 – 11).

### ***Prior Art***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.



**Contact Information**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linh Van Nguyen whose telephone number is (571) 272-1810. The examiner can normally be reached from 8:30 – 5:00 Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Rexford Barnie can be reached at (571) 272-7492. The fax phone numbers for the organization where this application or proceeding is assigned are (571-273-8300) for regular communications and (571-273-8300) for After Final communications.

  
REXFORD BARNIE  
SUPERVISORY PATENT EXAMINER

01/31/06

Linh Van Nguyen

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